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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/809,303	03/24/2004	Wenman Li	ye- pt009	6520

28394 7590 05/22/2006

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EXAMINER

MURALIDAR, RICHARD V

ART UNIT PAPER NUMBER

2838

DATE MAILED: 05/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/809,303

Applicant(s)

LI, WENMAN

Examiner

Richard V. Muralidar

Art Unit

2838

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Drawings***

The drawings are objected to for the following reasons: Fig. 1 has an open in the primary winding of high frequency transformer 75. Either a connecting wire, or a component appears to be missing.

The trigger signal generator 70 is fed by a transformer with its primary winding open and not connected to anything.

The biasing components of the lower transistor connected to trigger signal generator 70 appears to be floating and not connected to anything.

The purpose of the terminals designated by the letter A, connected to resistor 95 are not explained, either in the drawings or the specifications. Appropriate correction is required.

### ***Claim Objections***

Claim 5 is objected to for improper grammatical format. Claim 5 has been interpreted to mean *charging is completed when all voltage threshold comparison circuits stop outputting a high level signal*. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-5 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

With respect to Claim 1 lines 9-10, applicant refers to a high frequency energy conversion circuit for converting leftover charging energy back to the entire battery pack. However, it is not apparent from the specs [page 4 lines 11-20] exactly how this is occurring. The drawing in Fig. 1 also does not differentiate a "high frequency circuit" from among the other components, nor does it show how a high frequency circuit [interpreted to consist of the transformer 75, and switches 60 and 65] converts leftover charging energy for the entire battery pack, once a single battery has completed charging. Claim 1 lines 11-12 which states "*a trigger signal generator generates high frequency rectangular wave, which are sent to said high frequency energy conversion circuit for enabling energy conversion process*" is unclear because there does not appear to be any way for this signal to get from the trigger circuit 70 to the base of BG2 65, either in drawing 1 or the specification. Page 4 lines 11-14 of the specification reads "*At the meaning time, a synchronized trigger signal generator 70 sends rectangular waves to the base of BG2 65, and through the collector, the DC energy is converted to a high frequency electrical energy with rectangular wave shape and this energy is fed to the high frequency transformer (L2 75).*" There does not appear to be any means for the rectangular waves from the trigger signal generator 70 to get to the high frequency transformer 75.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103[a] which forms the basis for all obviousness rejections set forth in this Office action:

[a] A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5 are rejected under 35 U.S.C. 103[a] as being unpatentable over Kaneko [U.S. 5850136] in view of Melse [U.S. 5933049].

With respect to Claim 1, Kaneko discloses a charging/discharging management system for Lithium battery packs [col. 1 lines 5-8; col. 5 lines 31-36] comprising: means for determining by a first comparison circuit [Fig. 6 comparator 13] whether the voltage of a rechargeable battery [Fig. 4, rechargeable battery B1] reaches or falls below a designated lower level during is charging; when this occurs said comparison circuit sends a signal to a control circuit [Fig. 4, driving circuit 14 and switching device 11; col. 6 lines 25 to 59; col. 7 lines 58-67 and col. 8 lines 1-16] to cut off the load accordingly [Figs. 4 and 6, the battery B1, which is the charging load, is charged when its voltage drops below a minimum threshold, then disengaged via switching device 11 when it is fully charged; col. 3 lines 5-42]; means for determining by a second comparison circuit [Fig. 6 comparator 14] whether the voltage of a rechargeable battery reaches a designated upper level during charging [col. 6 lines 25 to 59; col. 7 lines 58-67 and col. 8 lines 1-16]; when this occurs the said second comparison circuit sends a signal to a feedback circuit [col. 8 lines 49-58] to send leftover charging energy back to the entire

battery pack [col. 3 lines 5-23; col. 14 lines 1-15; col. 14 lines 34-40]. Kaneko teaches the use of a *direct current power source 1* in Fig. 1 to provide the charging energy for the batteries, but does not express any details concerning a high frequency energy conversion circuit or a trigger signal generator, which are components that would be internal to this *power supply circuit*.

Melse teaches a flyback converter *power supply circuit* [a switched mode power supply] for battery chargers [col. 5 lines 30-38; col. 1 lines 15-23; col. 2 lines 25-32] that shows a high frequency energy conversion circuit [Fig. 6, controller 36 in conjunction with switch 30 use high frequency pulses to convert energy across transformer 14; also load 8 contains a controller that sends pulses to switch 28 which also allows for the conversion of high frequency energy across the transformer 14]; and a trigger signal generator [Fig. 6 controller 36 and the controller in load 8] generates high frequency rectangular waves [both switch 28 and 30 use duty cycle switching; col. 5 lines 23-26; col. 5 lines 61-67 and col. 6 lines 1-9], which are sent to said high frequency energy conversion circuit for enabling energy conversion process.

Kaneko and Melse are analogous battery charging devices. At the time of the invention it would have been obvious to one of ordinary skill in the art to specify the circuit details of and/or add the flyback converter power supply with high frequency energy conversion circuit and trigger circuit to Kaneko for the benefit of further enabling the battery charger power supply circuitry. It is also widely known to be advantageous to use switched mode power supplies as power supply circuits because they provide

isolation from the ac mains, have greater efficiency, and enables reduced weight of the power supply [Melse, col. 1 lines 24-30].

With respect to Claim 2, Kaneko teaches said first comparison circuit is an OP AMP [Fig. 6 first comparator is OP AMP 13].

With respect to Claim 3, Kaneko teaches said second comparison circuit is an OP AMP [Fig. 6 second comparator is OP AMP 14].

With respect to Claim 4, Melse discloses said high frequency energy conversion circuit further comprising a first and a second FETs [Fig. 6 first FET is FET 30, second FET is FET 28] and a high frequency transformer [Fig. 6 transformer 14]; where the signal generated by said second comparison circuit [Fig. 6 comparators 44 and 50 are analogous to the comparators 13 and 14 of Kaneko since they sense the voltage across battery pack 6 via transformer 14] is amplified by said first FET [Fig. 6, latch 48 accepts signals from comparators 44 and 50 and acts as a feedback amplifier from the comparators to controller 36 to affect the switching of FET 30] and then fed through said second FET [energy created across transformer 14 by the switching action of FET 30 is regulated by FET 28 to supply power to the load and battery pack 6] aided by rectangular signals [both switch 28 and 30 use duty cycle switching; col. 5 lines 23-26; col. 5 lines 61-67 and col. 6 lines 1-9] from said trigger signal generator [Fig. 6 controller 36 and the controller in load 8], in which the charging electrical energy is converted into high frequency electrical energy [as a result of the switching action of FET 30 on across the transformer 14] then is transformed by said transformer and rectified [Fig. 6 diode 20], filtered [not shown in Melse, but it is well known in the art of

power supplies to filter the power before sending it to the load for the purpose of ripple smoothing, as is shown in Kaneko, Fig. 6 filter 62], and eventually sent back to the entire battery pack [Fig. 6 battery pack 6].

With respect to Claim 5, Kaneko teaches when all battery units meet the charging requirements, all upper voltage threshold comparison circuits [Fig. 6 comparators 13 and 14] no longer sending output at high electrical levels, which indicates the charging is completed [Fig. 6, col. 6 lines 25-59; col. 13 lines 44-65 charging is terminated using a timer].

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Prior art [U.S. 20040155627] by Stanesti et al is cited for the disclosure of a multiple battery power management system that uses multiple voltage comparators to control the charging and discharging of lithium batteries. Prior art [U.S. 6268711] by Bearfield is cited for the disclosure of a battery manager system that controls the charging and discharging of multiple batteries using FET control logic. Prior art [U.S. 20040145348] by Bucur et al is cited for the disclosure of power management of multiple batteries of an UPS system, with selective control over charging, discharging, and individual battery or parallel power supply modes.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard V. Muralidar whose telephone number is 571-272-8933. The examiner can normally be reached on Monday to Friday 8:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Gray can be reached on Monday to Friday 8-5. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RVM  
5/11/2006

  
KARL EASTHOM  
SUPERVISORY PATENT EXAMINER